

Petr Stepanov

Materials science. Gamma spectroscopy. Data analysis and computer simulations.

✉ stepanovps@gmail.com ☎ [\(419\) 496-86-02](tel:(419)496-86-02) 🏠 petrstepanov.com 🐙 github.com 🎮 dribbble.com
📖 scholar.google.com

Summary

Ph.D. graduate with expertise in gamma spectroscopy, positron annihilation spectroscopy, microscopy, and nuclear physics. Strong background in computational techniques: data analysis, particle simulations, software development (desktop and web applications).

Graduated from [BGSU](https://bgsu.edu) in May 2020. Seeking to become an effective member of a research group in the industry. Authorized to work in the US on [Optional Practical Training](#) (OPT) in physics, chemistry, and computer science. OPT expires in February 2023. Will consider visa sponsorship offers.

Computer Skills

Simulation and data analysis: Geant4, CERN ROOT, Wolfram Mathematica, Maple.

Academic writing: LaTeX, MS Office Suite, Zotero.

Data plotting: OriginLab, Gnuplot, QtiPlot, SciDaVis, Grapher.

Desktop applications development: C/C++ and Qt, GNU Automake, CMake, Java and Swing, Python, Fortran.

UI/UX design: Figma, Sketch, Adobe Photoshop, Adobe Illustrator, Inkscape, Blender.

Frontend: HTML, CSS (LESS and SASS), Bootstrap, responsive web design, JavaScript and jQuery, npm, gulp, AngularJS, React.js. Google Web Toolkit. PHP and WordPress themes development.

Material Research Skills

Characterization facilities. Positron Lifetime and Doppler Broadening Annihilation Spectroscopy (PALS, DBAR). Atom Probe Tomography (APT). Scanning Electron Microscopy (SEM). Transmission electron microscopy (TEM). Atomic Force Microscopy (AFM). UV-VIS Spectroscopy. Fourier Transform Infrared Spectroscopy (FTIR).

Material processing. High-temperature annealing. Wet chemical etching. Electrical Contact Fabrication. Sample polishing.

Work Experience

Research Collaborator (On-Site)

[Thomas Jefferson National Accelerator Facility \(JLab\)](#) Jul 2020 - Current

- Applied CERN ROOT framework (C++) to perform statistical analysis of a significant amount (over 100 GB) of the raw experimental data of the [Kaon LT](#) experiment at JLab. [Link to GitHub](#).
- Utilized SLURM environment on [JLab supercomputer environment](#) to run resourceful particle simulations on multiple computing nodes at the same time. This decreased the wall computation time by more than 10 times.
- Proposed and implemented RAMDisk functionality on the development environment. This led to an over 60% increase in source code indexing time.
- Set up data acquisition system that performs triggered waveform acquisition from Tektronix oscilloscope to a local Network Attached Storage (NAS) device. RedHat, Ethernet, SAMBA, Python, National Instruments VISA

library.

- Active collaborator of the [Pion LT project](#). Committed more than 50 shifts performing Target Operator and Shift Leader duties in the experimental Hall C counting room.

Postdoctoral Researcher (Remote)

[Catholic University of America \(CUA\)](#) *Jul 2020 - Current*

- Applied Machine Learning (ML) TMVA framework to perform binary classification of thousands of signals from a data acquisition (DAQ) setup. [Link to GitHub](#).
- Developed a computer simulation based on the Geant4 framework (C++, CMake, Eclipse IDE, gdb) to study optical properties of a novel scintillation material to be used in the EIC detector system. [Link to GitHub](#).
- Teaching experience: mentoring students within a 3-month Research Experiences for Undergraduates (REU) program at the Physics Department at CUA. Giving talks and presentations about [Linux Terminal](#), and [supercomputer environment](#).
- Enhanced debugging of the core library source code lead to opening more than [10 bug reports](#) on the ROOT (C++) forum.

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